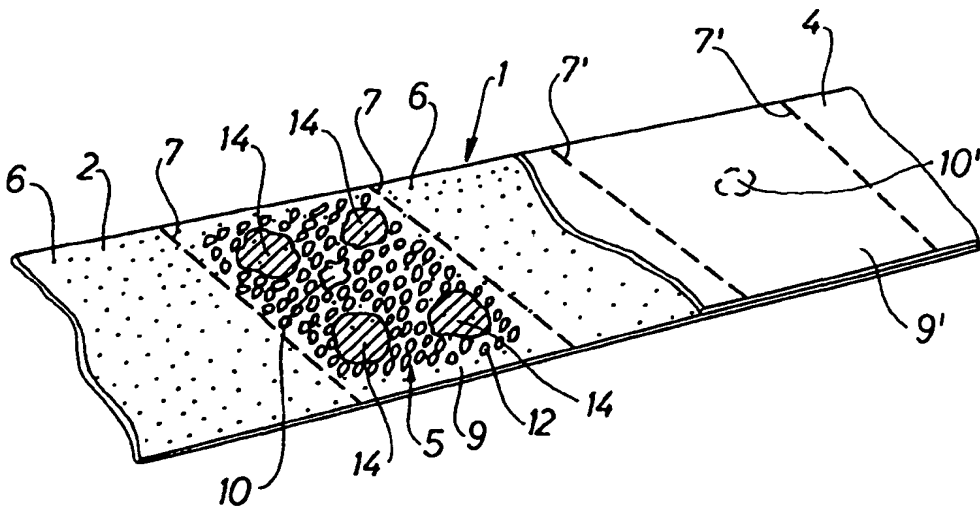




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/DK99/00349 <b>(22) International Filing Date:</b> 23 June 1999 (23.06.99) <b>(30) Priority Data:</b> PA 1998 00838 29 June 1998 (29.06.98) DK <b>(71) Applicant (for all designated States except US):</b> BENTLE PRODUCTS AG [CH/CH]; Grabenstrasse 1, CH-6301 Zug (CH). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> AHM, Poul, Henrik [DK/ES]; Adf. Mar Bella, Atico A, Calle San Pedro, 43, E-03590 Altea (ES). <b>(74) Agent:</b> CHAS. HUDE A/S; H.C. Andersens Boulevard 33, DK-1553 Copenhagen V (DK).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> TAPE WITH GERMINATING UNITS AND PACKING THEREOF, AS WELL AS A METHOD AND AN ASSEMBLY FOR THEIR PRODUCTION   <b>(57) Abstract</b> <p>A tape (1) with germinating units (9) comprising growth-suited parts of a plant, such as seeds, meristems or the like parts (10), which are able to develop into plants in the tape (1). The tape and the germinating units comprise at least one or two, respectively, biodegradable material layers (2, 4), such as paper, and are suited for a mechanical bedding out with the plants vertically arranged in a furrow in the ground. The tape (1) comprises furthermore a mixture (5) of a carrier (12) and additives permanently or loosely bound to said carrier in each germinating unit (9). The additives are suited for protecting the plant (10) against undesired effects and for controlling the moisture conditions about the plant and the development and growth of said plant in the tape (1). The parts of a plant (10) and the mixture (5) are attached to at least one of the material layers (2, 4), and the material layers (2, 4) are secured to one another in each germinating unit (9) about the parts of a plant (10) and the mixture (5) by means of a glue (6, 6') and/or by being pressed into one another.</p>		

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Title: Tape with germinating units and packing thereof, as well as a method and an assembly for their production.

Technical Field.

The invention relates to a tape with germinating units succeedingly arranged in the longitudinal direction of said tape, where the germinating units comprise growth-suited parts of plants, such as seeds, meristems or the like parts, which are able to develop into plants in the tape, or where the tape comprises plants developed from said parts of plants as the tape is placed edgewise, and where the tape and the germinating units comprise at least one or two, respectively, joined strips of paper or another biodegradable material, and where said tape and said germinating units with the plants developed therein are suited for an automatic, mechanical bedding out in a furrow in the ground in such a manner that the plants are vertically arranged at a desired depth.

Background Art

15 The above is known from the Applicant's own application, cf. DK-171,407-B1.

EP 0 056 687-A3 discloses a seed tape comprising a strip of biodegradable material vertically bedded out in the soil, and whereby seeds are attached to the upper portion of said strip and concentrated fertilizers and optionally other chemicals are attached to the lower portion of said strip. As stated, this publication deals with a seed tape, and apparently no measures have been taken for making this tape with the germinated plants suited for a mechanical bedding out.

EP 0 097 735 A1 discloses a method of attracting and bedding out plants or radicles, where a cigar-shaped sleeve of paper, plastic sheet or the like biodegradable material is used for each plant. The cigar-shaped sleeve is filled with earth, peat or another

growth substrate, in which a seed is placed. The sleeves are attached to a tape or a wire, and together with said tape or wire the sleeves are rolled or folded up into a package. The plants are developed in a greenhouse in the package before they are bedded out in the sleeve one by one or together with the tape.

5

### Brief Description of the Invention

The object of the invention is to provide a seed or plant tape with germinating units, where the tape is inexpensive to produce, biodegradable and environmentally acceptable, where the plants can develop in the tape under the most favourable conditions  
10 while said tape is placed edgewise, where the tape with the germinated plants is suited for a mechanical bedding out with a permanent distance between the plants and at a correct height, and where the tape or the germinating units comprise the substances necessary for ensuring an optimum germination and continued favourable growth and protection of the plants.

15 Another object of the invention is to provide a tape prepared for a mechanical bedding out of the individual germinating units with plants.

A particular object of the invention is to provide a tape ensuring an optimum ratio of air (oxygen) to moisture about the seeds and the roots of the plant both before, during and after the germination of said plants.

20 Yet another object of the invention is to provide a tape, where both the nature, the amount and the placing and release of the added substances ensure the most favourable effect on the development of the plants and the highest possible environmental protection consideration.

An additional object of the invention is to provide a package of the tape, which

particularly ensures uniform and favourable germination and growth conditions, and which furthermore ensures an unproblematic and rational handling and mechanical bedding out of the tape.

- The tape according to the invention is characterised in that the tape further comprises
- 5 at least one mixture preferably placed in the germinating units about each plant or part of plant, where the mixture comprises a carrier and additives permanently or loosely bound to said carrier by means of a binder, and where said additives are suited for protecting the plant and/or the tape against undesired effects, for controlling the moisture conditions about the plant and the development of said plant in the
- 10 tape, and optionally for indicating the biological development in the tape, and that the plants or the parts of the plant and the mixture are attached to at least one of the strips, and that the strips in each germinating unit are kept together about the plants or the parts of the plant and the mixture by means of a glue and/or by being mechanically pressed into one another.
- 15 As a result, each plant or part of a plant is contained in a germinating unit and attached to the tape together with the mixture or the mixtures in such a manner that said tape can stand up to a mechanical handling without said plants or parts of a plant being displaced in or falling out of said tape. The carrier ensures the attachment of the additives, and several mixtures render it possible to selectively place said addi-
- 20 tives relative to the part of the plant. In addition it is possible to control the release of the additives with the result that optimum germination and growth conditions can be ensured for the plants.

- As the additives are placed locally about the germinating unit, it is possible to ensure that substances having a detrimental effect on the seed when applying in high concen-
- 25 trations are placed at a distance from said germinating unit and thus only reach the seed in a less concentrated form.

The carrier may according to the invention advantageously comprise one or more of the substances: vermiculite, perlite, zeolite, cellulose materials, such as wood fibres, sphagnum, burned clay, mineral fibres, such as rock wool or the like substances, whereby it is possible to obtain a desired degree of water retaining capacity, water  
5 conveying capacity, ion exchanging properties etc.

The additives may in principle comprise all substances compatible with the remaining selected materials and agents having a favourable effect on the storage, germination, and growth of the parts of the plant in question. The additives according to the invention may for instance comprise one or more of the substances: pesticides, including  
10 herbicides, insecticides, especially systemic insecticides, fungicides, virae, cultures of bacteria, cultures of fungi, such as Trichoderma, fungus spores, microencapsulated fungicides, eggs from useful insects, such as predatory nematodes, fertilizers, hormones, enzymes, animal repellants, pH-adjusting agents, carbon, clay particles, trace elements, such as molybdenum, wood fibres or wood powder, kieselguhr,  
15 surfactants, water-absorbing agents, such as superabsorbing polymer (SAP) or carboxymethyl cellulose (CMC), silica and other additives with favourable effects on the germination and the growth of plants, where several substances are available in microencapsulated form with the result that they are protected against biodegradation and a controlled release thereof can be carried out.

20 According to the invention the binder may advantageously comprise polyvinyl alcohol or polyethylene glycol or another plant-compatible binder, such as water or water containing polysaccharide or mixtures thereof.

The plants or parts of the plants are advantageously placed at a specific distance from one rim, viz. the upper rim, of the tape, which corresponds to the ideal bedding out  
25 depth in the soil for the plant in question. The latter is of particular importance when the plants are to be bedded out in form of a coherent tape.

As the paper used is glazed and provided with a glue film on the side facing inwards in the tape, and as the paper and the glue film are provided with microperforations surrounded by burrs facing inwards into the tape, it is ensured that the two paper strips of the tape adhere to one another and that both the parts of the plant and the mixtures adhere to said strips. In addition it is ensured that air can easily circulate into and out of the interior of the germinating units and that the roots of the plants can cling to the burrs.

The paper used is advantageously of a weight not exceeding  $80 \text{ g/m}^2$ , preferably not exceeding  $50 \text{ g/m}^2$ , especially maximum  $20 \text{ g/m}^2$ , whereby the material costs of the tape are as low as possible at the same time as a suitable strength of said tape is maintained. The paper can for instance be kraft paper.

One strip of material of the tape is made of crepe paper with the result that both a reduced frictional resistance and consequently also a reduced pull in the tape are obtained in connection with the mechanical bedding out of said tape.

The paper used is advantageously translucent in the moist state with the effect that light can penetrate to the seed during the germination process, said seed, such as a celery and tobacco seed, requiring a small amount of light during the germination process.

According to a particular embodiment of the tape, the germinating units may be closely juxtaposed, and cuts or weakening lines may be provided in the transitions between adjacent germinating units, said cuts or weakening lines allowing an easy separation of said germinating units, for instance by way of simply tearing off the outermost germinating unit in order to separately bed out said germinating unit.

According to the invention the tape may be available as a package, especially a package wherein the tape is folded up in a zigzag way, said tape optionally being

placed in a bag or a box. Such a shape of the tape turned out to be very favourable both for ensuring a uniform space for the plants during the germination and the growth in the package and for ensuring a rational handling of the tape both in storage and transit as well as especially at the bedding out.

- 5 The invention relates also to a method of producing the tape according to the invention, and this method is characterised in that seeds are put down in rows on a first length of material, preferably on a glue layer placed thereon, in the longitudinal direction of said length of material in such a manner that said seeds are fixed at regular intervals in the rows, and that a mixture of at least one carrier and additives
- 10 bound to said carrier by means of a binder is put down about each seed, and that subsequently a second length of material is placed on top of the first length of material, and that the two lengths of material are subjected to a stamping process in the portions surrounding the seeds and the mixture so as to locally secure the lengths of material to one another by way of gluing and/or pressing about the individual seeds
- 15 and the mixture. This method turned out to be particularly advantageous for ensuring a reliable packing of the seeds and the mixture in a closed germinating unit in such a manner that they are not displaced in or fall out of said germinating unit.

- A particularly simple and reliable embodiment of the method according to the invention is characterised in that the stamping process is established by means of two
- 20 co-acting profiled wheels or rolls, which optionally at the same time establish interrupted cuts or weakening lines in the lengths of material between the seeds in the rows.

- A further particularly simple embodiment of the method according to the invention is characterised in that the lengths of material secured to one another are longitudinally cut between the rows of seeds and optionally transversely between said seeds,
- 25 whereby germinating tapes or separate germinating units are provided.



According to yet another particularly preferred embodiment of the method according to the invention the tape resulting from the longitudinally cutting is folded up in a zigzag way into a package and subsequently placed in a germinating box with the rim side of said tape resting on a base, whereby an advantageous germination of the seeds  
5 into plants is carried out in said box, said plants being ready for a bedding out in vertical position together with the tape.

The invention relates furthermore to an assembly for carrying out the method according to the invention, and this assembly is characterised in that it comprises a device for advancing a first length of material in a substantially horizontal plane, a seed  
10 dispensing station for putting down seeds onto the first length of material preferably provided with a glue layer in such a manner that the seeds are arranged at regular intervals in rows in the longitudinal direction of said length of material, a mixture dispensing station for placing the mixture at or about each seed, a joining station for lowering a second length of material onto the first length of material, a stamping  
15 station for joining the two lengths of material in the portions between the seeds and optionally for establishing interrupted cuts or weakening lines between the seeds in the rows by way of stamping, said lengths of material being locally pressed together and/or into one another about the individual seeds with the associated dispensed mixture, a cutting station with a first set of cutting means for longitudinally cutting  
20 the lengths of material secured to one another between the rows of seeds, and a second set of cutting means for optionally transversely cutting the lengths of material secured to one another between the seeds, as well as a folding up and packing station to form packages of zigzagged tapes, and a germinating station comprising the germinating boxes for germination of the zigzagged tapes into tapes with plants ready for  
25 a bedding out. This assembly turned out to be particularly efficient for carrying out the method according to the invention. In addition, the assembly does not take up much room, and the produced packages take up minimum room both in storage, in transit and during the germination. Moreover a significant advantage is found in the fact that the germinating boxes used for the germination can be used in transit as well

as for the mechanical bedding out of the tapes by means of a bedding machine.

### Brief Description of the Drawings

The invention is explained in detail below with reference to the accompanying drawing, in which

- 5 Fig. 1 is a perspective view of a segment of a tape according to the invention, where one material layer has been partially removed, said view showing germinating units containing seeds, carrier and additives prior to the germination,

Fig. 2 is a sectional view through a germinating unit,

- 10 Fig. 3 is a sectional side view through a tape with germinated plants,

Fig. 4 is a sectional side view through a tape with closely juxtaposed germinating units with transitions with interrupted cuts,

Fig. 5 is a top view of a package of a zigzagged non-germinated tape according to the invention,

- 15 Fig. 6 is a flow sheet of an assembly according to the invention for the production of the tape, and

Fig. 7 is a perspective view of a device for locally dispensing additives to a germinating unit.

### Best Mode for Carrying Out the Invention

- 20 Fig. 1 is a sectional view of a tape 1 according to the invention, which comprises two

material layers 2, 4, one layer 4 thereof being partially removed for the sake of clarity. The bottom material layer 2 is provided with a glue coating 6 indicated by way of dots, and a corresponding glue coating 6' is provided on the side of the material layer 4 facing said side of the bottom material layer 2, cf. also Fig. 2. The  
5 broken lines 7, 7 and 7', 7' indicate the delimitations to two germinating units 9, 9'. A seed 10, 10', a mixture 5 of carriers 12 for the binder and additives (not shown), as well as locally dispensed additives 14 are put down in the germinating units 9, 9'. The seeds 10, 10' and the mixture 5 of the carriers 12 and the additives 14 are re-  
10 tained by the glue coatings 6, 6', and the material layers 2, 4 are also secured to one another by means of the glue coatings 6, 6' about the seeds 10, 10' and the mixture 5.

Fig. 2 is a sectional view through a germinating unit 9' of Fig. 1. The two material layers 2, 4 appear with the glue coatings 6, 6' as well as a seed 10' and the mixture 5 with the carriers 12. The material layers 2, 4 are secured to one another about the  
15 seeds and the mixture by means of the glue coatings 6, 6'.

Fig. 3 is a sectional side view of a tape 1 of Fig. 1. This tape 1 has been subjected to a germinating process with said tape standing on the rim 16 in such a manner that the seeds 10 have developed into plants with a radicle 18, adventitious roots 20, a stem 22, seed leaves 24 and a defining leaf 26. The illustrated tape 1 is ready for a  
20 mechanical bedding out in a furrow in the ground at a desired height and with the shown bedding out distance as the desired permanent distance between the plants.

Fig. 4 is a sectional view of a tape 1 with closely juxtaposed germinating units 9, where the transitions between the germinating units are provided with interrupted cuts 28. The cuts 28 render it easy to separate the tape 1 into its individual germinat-  
25 ing units 9 in order to bed out said units 9 separately. Again the tape 1 has been subjected to a germinating process while standing on the rim 16 in such a manner that the seeds 10 have developed into seedlings with a radicle 18, stem 22 and seed

leaves 24.

Fig. 5 is a top view of a package 30 of a zigzagged non-germinated tape 1 with germinating units 9 like the tape 1 of Fig. 1. The package 30 is placed in a germinating box 32 and shown with a significantly reduced filling or density compared to  
5 ordinarily used packages for the sake of clarity.

It should be noted that as a general rule the zigzags 33 of the package should not extend beyond one another, but be almost uniformly distributed across the width of the package. Correspondingly, the germinating units 9 should be uniformly distributed across the width of the package so as to provide equal space for each germinat-  
10 ing unit 9 and consequently for each plant.

Fig. 6 is a flow sheet of an assembly according to the invention for the production of the tape 1. The assembly comprises a station 40 allowing a length of material 2 to be pulled off therefrom. This length of material is provided with a glue coating 6 of the type permanently gluing adhesive. The assembly comprises furthermore a  
15 seed dispensing station 42 for putting down seeds 10 onto the length of material 2. The seeds 10 are placed at regular intervals in rows in the longitudinal direction of the length of material.

Moreover, a mixture dispensing station 44 is provided, which dispenses the mixture  
5 of carrier 12, binder and additives in portions onto the length of material 2 at or about each seed 10. The second length of material 4 is carried about a guide roller 46 and downwards and towards the first length of material 2 at a joining station 48, where said lengths of material are joined. Moreover a stamping station 50 is provided for joining the two lengths of material 2, 4 in portions between the seeds 10 and the mixture 5. This station can also establish interrupted cuts 28 or weakening lines  
25 between the seeds 10 in the rows by way of stamping, said lengths of material being locally pressed together and/or into one another about the individual seeds 10 with

the associated dispensed mixture 5. Furthermore, the assembly can be provided with a cutting station 52 with a first set of cutting means for longitudinally cutting the joined lengths of material between the rows of seeds, and a second set of cutting means for optionally transversely cutting the joined lengths of material between the seeds. The latter has also been diagrammatically illustrated. Furthermore, the assembly can comprise a packing station 54 adapted to pack the ready-made germinating units or germinating tapes in such a manner that the package used is preferably shrunk about said germinating units or germinating tapes. Finally, the assembly can comprise a germinating station 56, in which the tape 1 is placed in the packed state 30, cf. Fig. 5, in a germinating box 32 and then subjected to the germinating process suitable for the type of plant in question.

An additional station 58 can be coupled between the station 44 and the putting down of the second length of material 4, Fig. 7 showing an enlarged view of said additional station. This additional station 58 is used when the previously mentioned additives must be placed locally in portions 14 of the the germinating unit, and especially when said additives are to be applied by way of spraying in liquid state or by way of putting them down in form of granulated or powdered substances, cf. the portions 14 in Fig. 1. A tube 60 is provided on the bottom side of the additional station 58 for each of the desired portions 14. The additional station 28 can optionally be moved up and down, cf. the double arrow B to the very left of the Figure.

The invention may be modified in many ways without thereby deviating from the scope of the invention. Although the drawing only shows germinating units containing one seed or one plant, respectively, nothing prevents each germinating unit from containing more than one seed or one plant, respectively.

The term "biodegradable material" is in the present text to be construed as a material being biodegraded during the growing period of the culture in question.

Claims

1. A tape (1) with germinating units (9) succeedingly arranged in the longitudinal direction of said tape, where the germinating units comprise growth-suited parts of plants, such as seeds, meristems or the like parts (10), which are able to develop  
5 into plants in the tape, or where the tape comprises plants developed from said parts of plants, as the tape is placed edgewise, and where the tape and the germinating units comprise at least one or two, respectively, joined strips (2, 4) of paper or another biodegradable material, and where said tape and said germinating units with the plants developed therein are suited for an automatic, mechanical bedding out in  
10 a furrow in the ground in such a manner that the plants are vertically arranged at a desired depth, c h a r a c t e r i s e d in that the tape further comprises at least one mixture (5) preferably placed in the germinating units about each plant or part of plant, where the mixture (5) comprises a carrier (12) and additives permanently or loosely bound to said carrier by means of a binder, and where said additives are  
15 suited for protecting the plant and/or the tape against undesired effects, for controlling the moisture conditions about the plant and the development of said plant in the tape (1), and optionally for indicating the biological development in the tape, and that the plants or the parts (10) of a plant and the mixture (5) are attached to at least one of the strips (2, 4), and that the strips (2, 4) in each germinating unit (9) are kept  
20 together about the plants or the parts (10) of a plant by means of a glue (6, 6') and/or by being mechanically pressed into one another.
2. A tape as claimed in claim 1, c h a r a c t e r i s e d in that the carrier (12) comprises one or more of the substances: vermiculite, perlite, zeolite, cellulose materials, such as wood fibres, sphagnum, burned clay, rock wool or the like substances.
- 25 3. A tape as claimed in claim 1 or 2, c h a r a c t e r i s e d in that the additives comprise one or more of the substances: pesticides, including herbicides, insecticides, especially systemic insecticides, fungicides, virae, cultures of bacteria, cultures

of fungi, such as Trichoderma, fungus spores, microencapsulated fungicides, eggs from useful insects, such as predatory nematodes, fertilizers, hormones, enzymes, animal repellants, pH-adjusting agents, carbon, clay particles, trace elements, such as molybdenum, wood fibres or wood powder, kieselguhr, surfactants, water-absorbing substances, such as superabsorbing polymer (SAP), carboxymethyl cellulose (CMC), silica and other additives with favourable effects on the germination and the growth of plants, where several substances are available in microencapsulated form.

4. A tape as claimed in one or more of the claims 1 to 3, characterised in that one or more of the additives is/are placed in local portions (14) of the germinating unit (9), for instance by way of spraying in liquid state or by being put down in form of granulate or powder.

5. A tape as claimed in one or more of the claims 1 to 4, characterised in that the binder comprises polyvinyl alcohol or another plant-compatible binder, such as water or water containing polysaccharide or mixtures thereof.

6. A tape as claimed in one or more of the claims 1 to 5, characterised in that the plants or the parts (10) of a plant are placed at a specific distance from one, viz. the upper, rim of the tape, which corresponds to the ideal placing depth in the soil of the plant in question.

7. A tape as claimed in one or more of the claims 1 to 6, characterised in that the paper used is glazed on the side facing inwards in the tape and is provided with a glue film (6, 6'), and that the paper and the glue film are provided with microperforations surrounded by burrs facing inwards into the tape.

8. A tape as claimed in one or more of the claims 1 to 7, characterised in that the paper used is of a weight not exceeding 80 g/m<sup>2</sup>, preferably not exceeding

50 g/m<sup>2</sup>, especially maximum 20 g/m<sup>2</sup>.

9. A tape as claimed in one or more of the claims 1 to 8, where said tape (1) comprises two strips of material (2, 4), characterised in that one strip of material is made of crepe paper.

5 10. A tape as claimed in one or more of the claims 1 to 9, characterised in that the paper used is translucent in the moist state.

11. A tape as claimed in one or more of the claims 1 to 10, characterised in that the germinating units (9) are closely juxtaposed, and that cuts (28) or weakening lines are established in the transitions between adjacent germinating  
10 units, said cuts (28) or weakening lines allowing an easy separation of said germinating units (9).

12. A package (30) of tapes as claimed in one or more of the claims 1 to 11, characterised in that it comprises a zigzag folded tape (1) as claimed in one or more of the claims 1 to 11, where said tape is optionally placed in a bag or a box.

15 13. A method of producing the tape and the package as claimed in one or more of the claims 1 to 12, characterised in that seeds are put down in rows on a first length of material (2), preferably on a glue layer (6) placed thereon, in the longitudinal direction of said length of material in such a manner that said seeds are fixed at regular intervals in the rows, and that a mixture (5) of at least one carrier  
20 (12) and additives bound to said carrier by means of a binder is put down about each seed, and that subsequently a second length of material (4) is placed on top of the first length of material (2), and that the two lengths of material (2, 4) are subjected to a stamping process in the portions surrounding the seeds (10) and the mixture (5) so as to locally fix the lengths of material to one another by way of gluing and/or  
25 pressing about the individual seeds and the mixture.



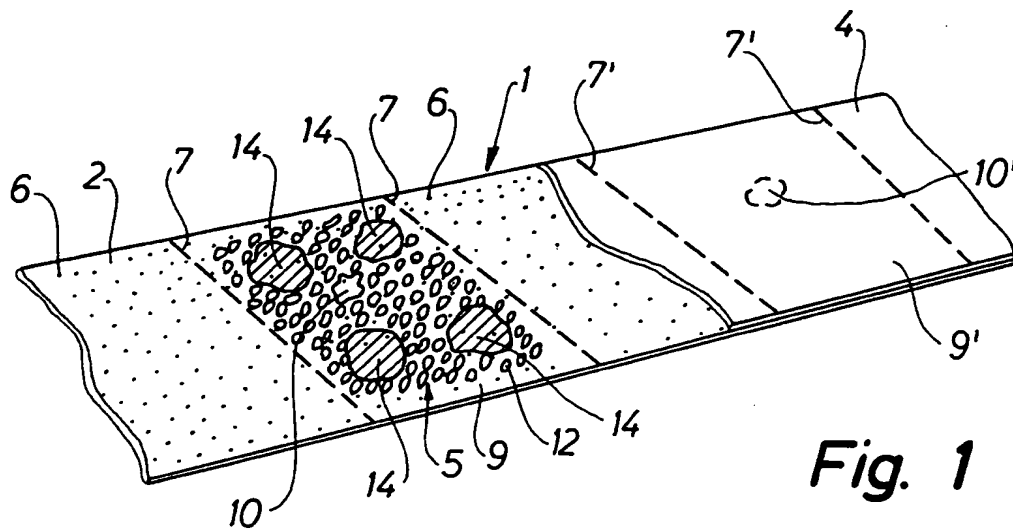
14. A method as claimed in claim 13, c h a r a c t e r i s e d in that the stamping is established by means of two co-acting profiled wheels or rolls, which, if desired, simultaneously establish interrupted cuts or weakening lines in the lengths of material (2, 4) between the seeds (10) in the rows.

5 15. A method as claimed in claim 13 or 14, c h a r a c t e r i s e d in that the joined lengths of material (2, 4) are longitudinally cut between the rows of seeds and optionally transversely between said seeds.

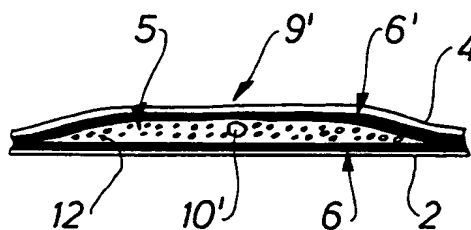
16. A method as claimed in claim 13, 14 or 15, c h a r a c t e r i s e d in that the tape resulting from the longitudinally cut is folded up in a zigzag way into a  
10 package (30) and subsequently placed in a germinating box (32) with the rim side (16) of said tape resting on a base, whereafter an advantageous germination of the seeds (10) into plants is carried out in said box, said plants being ready for a mechanical bedding out in vertical position together with the tape (1).

17. An assembly for carrying out the method as claimed in one or more of the  
15 claims 13 to 16, c h a r a c t e r i s e d in that it comprises a device (40) for advancing a first length of material (2) in a substantially horizontal plane, a seed dispensing station (42) for putting down seeds (10) onto the first length of material (2) preferably provided with a glue layer (6) in such a manner that the seeds are arranged at regular intervals in rows in the longitudinal direction of said length of material (2),  
20 a mixture dispensing station (4) for placing the mixture (5) at or about each seed (10), a joining station (48) for lowering a second length of material (4) onto the first length of material (2), a stamping station (50) for joining the two lengths of material (2, 4) in portions between the seeds (10) and optionally for establishing interrupted cuts (28) or weakening lines between the seeds in a row by way of stamping, said  
25 lengths of material being locally pressed together and/or into one another about the individual seeds with the associated dispensed mixture, a cutting station (52) with a first set of cutting means for longitudinally cutting the joined lengths of material

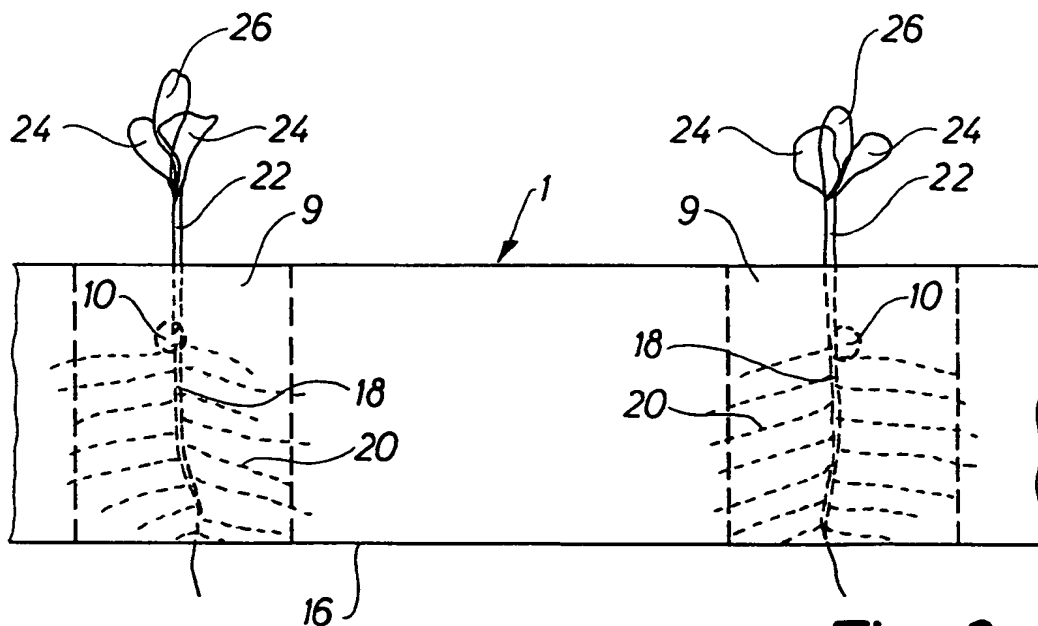
between the rows of seeds, and a second set of cutting means for optionally transversely cutting the joined lengths of material between the seeds, as well as a folding up and packing station (54) to form packages of zigzagged tapes, and a germinating station (56) comprising germinating boxes (32) for germination of the zigzagged  
5 tapes (30) into tapes with plants ready for a bedding out.



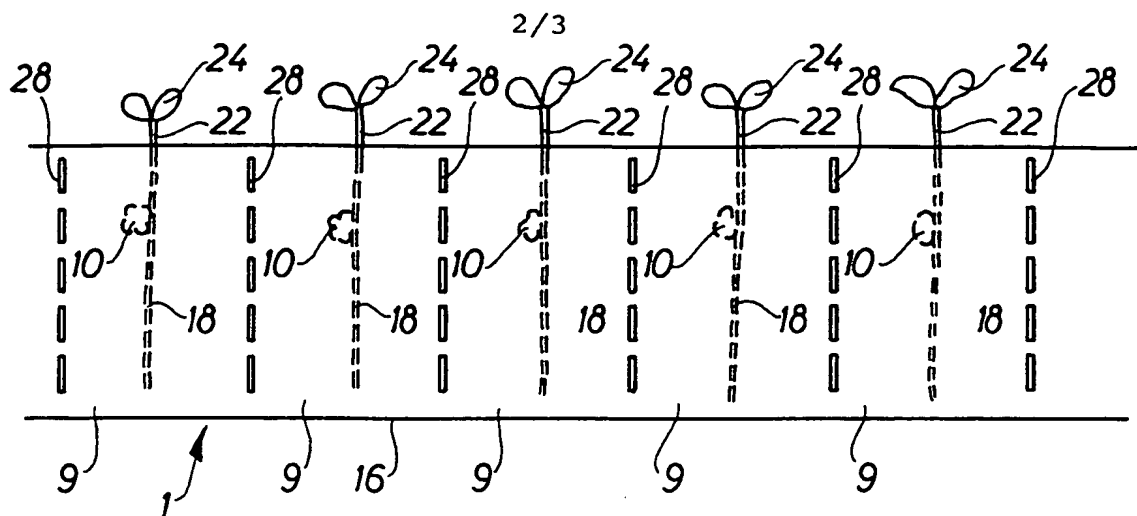
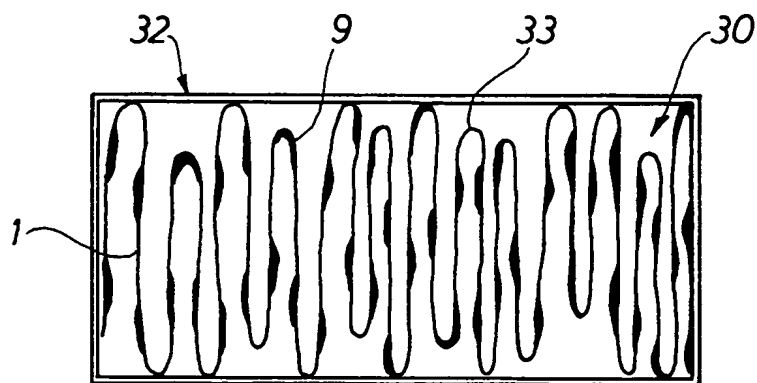
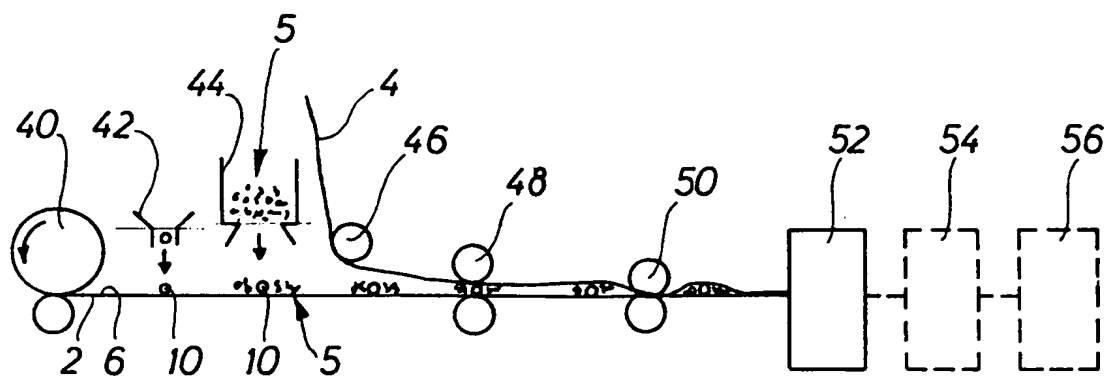
**Fig. 1**



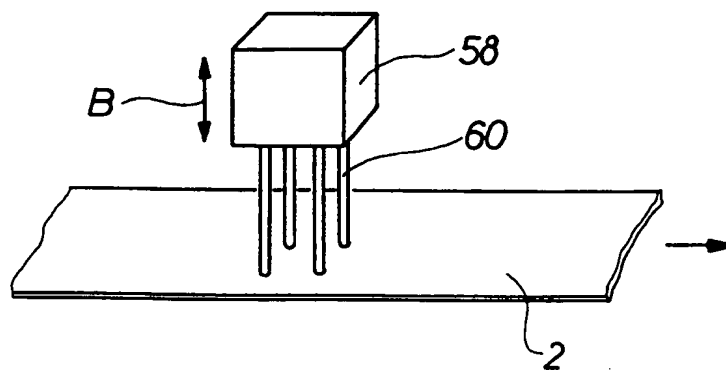
**Fig. 2**



**Fig. 3**

**Fig. 4****Fig. 5****Fig. 6**

3/3

**Fig. 7**

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 99/00349

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A01C 1/04 // A01G 9/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A01C, A01G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0182263 A1 (BENTLE PRODUCTS AG), 28 May 1986 (28.05.86), page 10, line 7 - line 13, abstract  --	1-17
Y	GB 2142213 A (TOKUGAWAEN CO LTD (JAPAN)), 16 January 1985 (16.01.85), page 1, line 81 - line 92, figure 2  --	1-17
A	US 5081791 A (G. BARON ET AL), 21 January 1992 (21.01.92), claim 6, abstract  --	1-17

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search

16 Sept 1999

Date of mailing of the international search report

20-10-1999

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 99/00349

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0823203 A1 (HONDA GIKEN GOGYO KABUSHIKI KAISHA ET AL), 11 February 1998 (11.02.98), column 19, line 45 - line 46, abstract  -- -----	1-17

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

30/08/99

International application No.  
PCT/DK 99/00349

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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GB 2142213 A	16/01/85	AU 561087 B AU 2854584 A FR 2565776 A,B	30/04/87 28/11/85 20/12/85
US 5081791 A	21/01/92	AT 57058 T AU 598783 B AU 6727687 A CA 1320640 A EP 0230799 A,B SE 0230799 T3 FR 2590761 A,B GR 3001106 T JP 63501768 T PT 83833 A,B WO 8703168 A	15/10/90 05/07/90 01/07/87 27/07/93 05/08/87 05/06/87 12/05/92 21/07/88 01/12/86 04/06/87
EP 0823203 A1	11/02/98	JP 2876397 B JP 9289834 A WO 9731522 A	31/03/99 11/11/97 04/09/97